

DETAILED ACTION

- This action is responsive to the following communication: Amendment after non-final action filed on 10/27/2009.
- Claims 1-9 are pending.

Response to Arguments

Applicant's amendments, filed 10/27/2009 have been entered and fully considered. However, applicant's arguments filed 10/27/2009 have been fully considered but they are not persuasive.

Applicant first argues that transfer unit (combination of elements 55, 63, 42, 44d of Numazu) does not rotate on cam 63 without explaining the reason behind it.

In reply, examiner asserts that as previously established and discussed in claim rejections below, Numazu clearly discloses that transfer unit is rotated on (around) the cam 63.

Applicant further argues that cam 63 of Numazu is not positioned at a place where the belt is not arranged.

In reply, examiner asserts that Numazu discloses that belt 43 is always located in the image transferable portion for drum 42, while cam 63 is located in a rotated position away from the belt 43, col. 12, lines 17-67. Thus, it is clear that cam 63 of Numazu is positioned at a place away from where the belt is arranged (also see figs. 1A and 2A with corresponding text).

Applicant further argues that Numazu discloses rotating only a part of the transfer unit (elements 55, 63, 42, 44a-44c) on the cam 63 and does not disclose rotating the

Art Unit: 2625

whole (entire) transfer unit (elements 55, 63, 42, 44d) on (around) the cam 63. Basically applicant is arguing the element 44d in transfer unit of Numazu does not rotate or move. Thus, the entire transfer unit does not rotate on cam 63.

In reply, examiner asserts, applicant's provides explanation in the arguments submitted 10/27/2009 referencing to the figures 6-7 of applicant's specification that transfer unit 5 comprises four transfer members (51a-51d) (fig. 6). But only the transfer unit 5 comprising 51b-51d rotates on fulcrum 50 in directions of moving to and from the image carriers (fig, 7). Next, applicant without giving any further explanation asserts that it is clear that the entire transfer unit 5 rotates about fulcrum 50.

In view of applicant's arguments regarding Numazu and applying the same logic, it is apparently clear from figure 7 of applicant's disclosure that not the whole transfer unit (element 5 with elements 51a-51d) rotates but only a part of transfer unit (element 5 with elements 51b-51d) rotates on the fulcrum 50. Element 51a does not rotate or move. Thus, applying the same logic as applied in Numazu's case, the entire transfer unit of applicant's inventions as disclosed also does not rotate on fulcrum 50.

Numazu discloses a similar setup in figs. 1-2 as applicant's apparatus shown in figs. 6-7. Examiner cannot seem to find the difference or basis to the applicant's arguments as both the applicant's and Numazu's apparatus tend to be operating in an identical manner. Thus, applicant's arguments have been rendered moot.

Applicant further argues Numazu fails to disclose that a distance between any two transfer members among all of the plurality of transfer members 44a-44d comprised by transfer unit (55, 63, 42, 44d) does not stay constant during the rotation. Although

Art Unit: 2625

Numazu does disclose that a distance between any two transfer members among some of the plurality of transfer members 44a-44c comprised by transfer unit (55, 63, 42, 44d) does stays constant during the rotation.

In reply, examiner first asserts that Numazu successfully discloses that a distance between any two transfer members among all the plurality of transfer members comprised by the transfer unit stays constant during a rotation of the transfer unit (note that *"The three image transfer brushes 44a, 44b and 44c...are integrally attached to the movable arm 55, and are vertically moved by the swing of the movable arm 55 relative to the conveyor belt 43"* (see column 12, lines 7-10). Also see figs. 1A, 5A-B with text, which shows that distance between *any two* image transfer brushes 44a, 44b or 44c stays constant among all the plurality of transfer members (44a-44d) comprised by the transfer unit (elements 55, 63, 42, 44d), before and after rotation/movement of the movable arm 55.

Secondly, again the same reasoning as given above regarding rotation of whole transfer unit applies here also. Since only elements 51b-51d rotate in applicant's disclosure (fig. 7) and element 51a stays stationary, and applying the same logic as applied in Numazu's case by the applicant, a distance between any two transfer members among all of the plurality of transfer members 51a-51d comprised by transfer unit (element 5 with 51a-51d) does not stay constant during the rotation but only a distance between any two transfer members among some of the plurality of transfer members 51b-51d stays constant during the rotation in applicant's invention also as disclosed.

Art Unit: 2625

Numazu discloses a similar setup in figs. 1-2 as applicant's apparatus shown in figs. 6-7. Examiner cannot seem to find the difference or basis to the applicant's arguments as both the applicant's and Numazu's apparatus tend to be operating in an identical manner. Thus, applicant's arguments have been rendered moot.

Rejections - 35 USC § 112

Previous 112 rejection(s) have been withdrawn in view of applicant's amendments to the claims(s).

Examiner Notes

Examiner cites particular columns and line numbers in the references as applied to the claims below for the convenience of the applicant. Although the specified citations are representative of the teachings in the art and are applied to the specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested that, in preparing responses, the applicant fully consider the references in entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the examiner.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

Art Unit: 2625

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 6 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by Numazu et al., US 5,765,082.

Re claim 1, Numazu discloses an image forming apparatus (see figure 1A) comprising: a plurality of image carriers (see 41a, 41b, 41c, 42 in figure 1A) arranged in a sheet transporting direction (direction H, see figure 1A) (see figs. 1A, 2A with text), the plurality of image carriers comprising an image carrier of black (element 42, fig. 1A, col. 14, lines 39-43) and an image carrier of a color other than black (elements 41a, 41b, 41c, in figure 1A, col. 14, lines 43-46); and a transfer unit (combination of arm 55, cam 63, drum 42, brush 44d, figs. 1-2 -- note that *image transfer brushes 44a, 44b and 44c...are integrally attached to the movable arm 55*", see column 12, lines 7-10), which has a plurality of transfer members (transfer brushes 44a-44d, figs. 1-2) corresponding to the respective image carriers image (transfer brushes 44a, 44b, 44c, and 44d correspond to the four photosensitive drums 41a, 41b, 41c and 42, respectively (col. 10, lines 31-54) and are regarded as to teach the "transfer members") (see figs. 1-2 with text), for transferring images carried on the respective image carriers (col. 10, lines 45-49) (see also col. 10, line 31-col. 11, line 6) and a belt (belt 43, fig. 1), which transports a sheet and is arranged to be suspended from two transfer members among the plurality of transfer members (see figures 1A and 2A with corresponding text, also note that support arm 55 has other rollers 56-57 from which belt can be suspended apart from plurality of transfer members mentioned above, col. 12, lines 17-67), wherein the

Art Unit: 2625

plurality of transfer members comprise a transfer member of black (transfer brush 44d, figs. 1A, 2A, note that transfer brush 44d is for photosensitive drum 42 corresponding to an image forming unit 77d containing black toner, col. 14, lines 39-46) and a transfer member of the color other than black (transfer brushes 44a, 44b, 44c, figs. 1A, 2A, note that transfer brushes 44a, 44b, 44c are for photosensitive drums 41a, 41b, 41c corresponding to an image forming unit 77a, 77b, 77c, respectively containing yellow, magenta and cyan toners, col. 14, lines 39-46), wherein the transfer unit comprises a rotary fulcrum (see cam 63, figures 1-2) positioned at a place where the belt is not located (see figures 1A and 2A with corresponding text, note that belt 43 is always located in the image transferable portion for drum 42, while cam 63 is located in a rotated position away from the belt 43, col. 12, lines 17-67), and whole transfer unit can be rotated around the rotary fulcrum in directions of moving to and from the image carriers (see figures 1A, 2A with text; col. 12, lines 11-45; column 15, lines 27-column 16, line 67, and discussion in arguments above), and wherein a distance between any two transfer members among all the plurality of transfer members comprised by the transfer unit stays constant during a rotation of the transfer unit (note that *"The three image transfer brushes 44a, 44b and 44c...are integrally attached to the movable arm 55, and are vertically moved by the swing of the movable arm 55 relative to the conveyor belt 43"* (see column 12, lines 7-10). Also see figs. 1A, 5A-B with text, which shows that distance between *any two* image transfer brushes 44a, 44b and 44c stays constant among all the plurality of transfer members comprised by the transfer unit, before and after

Art Unit: 2625

rotation/movement of the movable arm 55. Hence, the distance between *any two* transfer members stays constant during a rotation of the transfer unit assembly).

Re claim 2, Numazu discloses the transfer members (i.e. rollers) are movable in directions of moving to and from the image carriers (see figures 1A and 2A with corresponding text).

Re claim 6, Numazu further discloses the rotary fulcrum is provided separately from any shaft and transfer members (see figures 1A and 2A with corresponding text).

Re claim 9, Numazu further discloses wherein the belt path remains the same as the transfer unit is rotated on the rotary fulcrum in directions moving to and from the image carriers (see figs 2A, 5A-B; column 6, line 54-column 7, line 56; column 11, lines 55-59; column 15, lines 27-column 17, line 67).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- a. A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3, 5-7 are rejected under 35 U.S.C. 103 as being unpatentable over a Numazu et al., US 5,765,082 In view of Futoshi, JP 9-292753.

Art Unit: 2625

Re claim 3, Numazu fails to explicitly disclose the transfer unit includes a supporter for supporting the transfer members, and the supporter has the rotary fulcrum.

However, Futoshi teaches the transfer unit includes a supporter for supporting the transfer members, and the supporter has the rotary fulcrum (see paragraphs 4-11 in US 2004/0062577 and paragraphs 1-22 in Futoshi).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the image forming apparatus as disclosed by Numazu to include the image forming apparatus as taught by Futoshi for the benefit of having a proper image, which is formed by the easy configuration and tuning activity as taught by Futoshi at paragraph 22.

Re claim 5, Numazu further discloses a transfer unit (see explanation & discussion given in arguments & claim 1 above) comprising: a plurality of juxtaposed transfer members (see explanation & discussion given in claim 1 above); a belt (belt 43), which transports a sheet and is arranged to be suspended from two transfer members among the plurality of transfer members see figures 1A and 2A with corresponding text, also note that support arm 55 has other rollers 56-57 from which belt can be suspended apart from plurality of transfer members mentioned above, col. 12, lines 17-67), wherein the plurality of transfer members comprise a transfer member of black (transfer brush 44d, figs. 1A, 2A, note that transfer brush 44d is for photosensitive drum 42 corresponding to an image forming unit 77d containing black

Art Unit: 2625

toner, col. 14, lines 39-46) and a transfer member of the color other than black (transfer brushes 44a, 44b, 44c, figs. 1A, 2A, note that transfer brushes 44a, 44b, 44c are for photosensitive drums 41a, 41b, 41c corresponding to an image forming unit 77a, 77b, 77c, respectively containing yellow, magenta and cyan toners, col. 14, lines 39-46), wherein a rotary fulcrum (see element cam 63, figures 1-2) positioned at a place where the belt is not located (see figures 1A and 2A with corresponding text, note that belt 43 is always located in the image transferable portion for drum 42, while cam 63 is located in a rotated position away from the belt 43, col. 12, lines 17-67), and wherein a distance between any two of the transfer members among all of the plurality of transfer members comprised by the transfer unit stays constant during a rotation of the transfer unit (see figures 1A and 2A with corresponding text, and explanation & discussion given in claim 1 above).

Numazu fails to further disclose a supporter for supporting the plurality of transfer members so as to be rotatable and movable in a radial direction, and wherein the supporter comprises a rotary fulcrum.

However, Futoshi teaches a supporter for supporting the plurality of transfer members so as to be rotatable and movable in a radial direction (see paragraphs 4-11 in US 2004/0062577 and paragraphs 1-22 in Futoshi), wherein the supporter comprises a rotary fulcrum (see paragraphs 4-11 in US 2004/0062577 and paragraphs 1-22 in Futoshi).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention to modify the image forming apparatus as disclosed by Numazu to include the image forming apparatus as taught by Futoshi for the benefit of having a proper image, which is formed by the easy configuration and tuning activity as taught by Futoshi at paragraph 22.

Re Claim 6, Futoshi also teaches the rotary fulcrum is provided separately from any shaft and transfer members (see paragraphs 4-11 in US 2004/0062577 and paragraphs 1-22 in Futoshi).

Re claim 7, Numazu fails to further disclose the rotary fulcrum is fixed to the supporter.

However, Futoshi further teaches the rotary fulcrum is fixed to the supporter (see paragraphs 4-11 in US 2004/0062577 and paragraphs 1-22 in Futoshi).

5. Claim 4 & 8 is rejected under 35 U.S.C. 103 as being unpatentable over Numazu et al., US 5,765,082 in view of well-known art.

Re claim 4, Numazu further discloses the transfer unit (see figure 3) is rotatable on the rotary fulcrum (elements 63, 62, figure 1A) so that a distance between a first transfer member and an image carrier corresponding to the first transfer member comes to a separated position when the transfer unit is separated from the image carriers (see figures 1A and 2A with text), wherein the first transfer member is adjacent to a second transfer member, the second transfer member being closer to the rotary fulcrum than the first transfer member (see figure 1A).

Art Unit: 2625

Numazu does not disclose expressly an image carrier corresponding to the first transfer member comes to between 2.5 mm and 4 mm when the transfer unit is separated from the image carriers, wherein the first transfer member is adjacent to a second transfer member, the second transfer member being closer to the rotary fulcrum than the first transfer member.

However, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to separate the transfer unit with distance between 2.5 mm and 4 mm from the image carriers as an obvious design choice for having the transfer unit separated from the image carriers at a safe distance as desired. One of ordinary skill in the art, would have expected applicant's invention to perform equally well with Numazu's image forming apparatus because Numazu's invention provides the same advantages and solves the same problems illustrated by applicant's invention such that at separated position, the transfer belt only contacts the desired photoconductive element, hence there would be no rubbing between other photoconductor drums and transfer members or an instance of a poor transfer would ever occur. Furthermore, Mizoguchi et al., US 6,470,166, see column 6, lines 20-27 teaches "In order to protect drum 5a from damage, the contact position of roller 13Y with belt 3 is shifted from the contact position of drum 5a with belt 3 by distance X. This displacement thus avoids contacting drum 5a with roller 13Y via belt 3" (note that again the goal is the same and the distance X can be between 2.5 mm and 4 mm or as desired by the user to serve the same purpose).

Art Unit: 2625

Re claim 8, Numazu does not disclose expressly wherein the transfer unit is rotatable between 2° and 3° on the rotary fulcrum.

However, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to rotate the transfer unit between 2° and 3° on the rotary fulcrum as an obvious design choice for having the transfer unit separated from the image carriers at a safe distance. One of ordinary skill in the art, would have expected applicant's invention to perform equally well with Numazu's image forming apparatus because Numazu's invention provides the same advantages and solves the same problems illustrated by applicant's invention such that at separated position, the transfer belt only contacts the desired photoconductive element, hence there would be no rubbing between other photoconductor drums and transfer members or an instance of a poor transfer would ever occur.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

Art Unit: 2625

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PAWANDEEP S. DHINGRA whose telephone number is (571)270-1231. The examiner can normally be reached on M-F, 9:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David K. Moore can be reached on (571) 272-7437. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Art Unit: 2625

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